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**Controlling the Dispersion and Properties of Single-Walled Carbon Nanotube-Polymer Nanocomposite**[1] ASIF RASHEED, MARK DADMUN, Department of Chemistry, University of Tennessee, PHILLIP BRITT, DAVID GEOHEGAN, ILIA IVANOV, Oak Ridge National Lab — Carbon nanotubes possess extraordinary electrical and mechanical properties. Dispersing nanotubes in a polymer matrix provides an effective way to exploit these extraordinary properties, however this has been difficult to achieve due to strong inter tube interaction. Previous work in our lab has shown that optimized hydrogen bonding between a copolymer and an anisotropic filler enhances miscibility of the mixture. Controlling the extent of hydrogen bonding between a copolymer and carbon nanotube gives a well-dispersed nanocomposite for both single and multi-wall carbon nanontubes as indicated by Raman spectroscopy, dynamic mechanical analysis, electrical conductivity, optical microscopy and SEM. The amount of hydrogen bond interactions in the nanocomposite is controlled by varying the copolymer composition. The results are critical in understanding interfacial phenomenon in polymer and nanocomposites and provide a mechanism to design materials with tunable properties.

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